

The Centrifuge Research Center, located at the Waterways Experiment Station (WES), supports the Corps of Engineers and other Federal Agencies and collaborates with industrial, commercial, academic, and international organizations to address novel and demanding engineering and scientific problems worldwide.

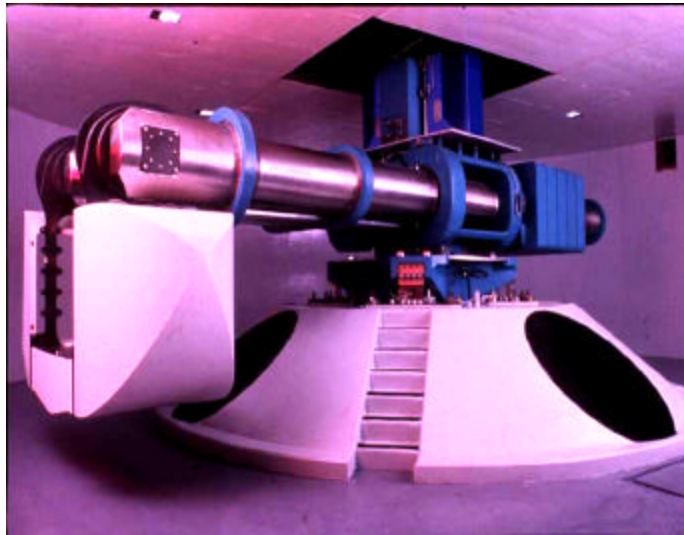


Figure 1. WES centrifuge.

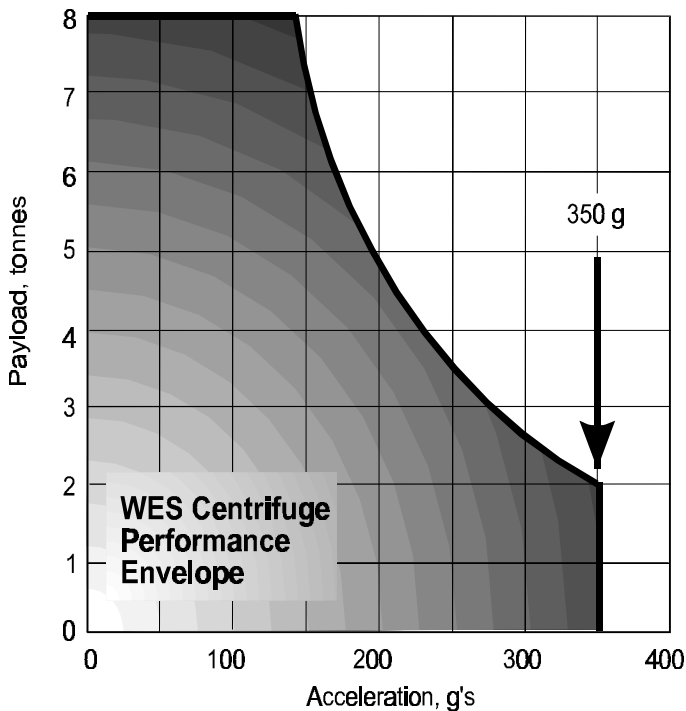


Figure 2. WES centrifuge performance envelope.

The centrifuge can recreate a wide range of field phenomena and environments under laboratory conditions, generating realistic data to verify and validate computer simulations and engineering analyses. Conditions imposed in the field are replicated in physical models that are subject to the full prototype self-weight stresses and strains.

Table 1. Key characteristics of the Army centrifuge.

Gravity range	10 to 350 g
Platform radius	6.5m
Payload at 143g	8000kg
Payload at 350g	2000kg
Centrifuge capacity	1144 tonnes

The Army centrifuge is unique in its range of capabilities and breadth of research applications. Primary thrusts of research are in the areas of:

- **Blast effects**
- **Contaminant and groundwater migration**
- **Earthquake response of earth structures**
- **Vehicle mobility and pavements**
- **Physics of frozen soils and water**
- **Hydraulic and coastal processes**
- **Soil-structure-interaction**

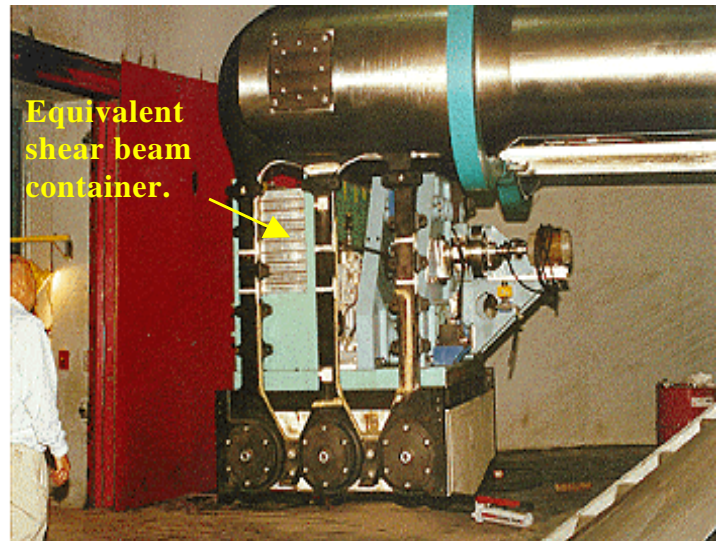


Figure 3. Dynamic load actuator, stored angular momentum, and equivalent shear beam container.

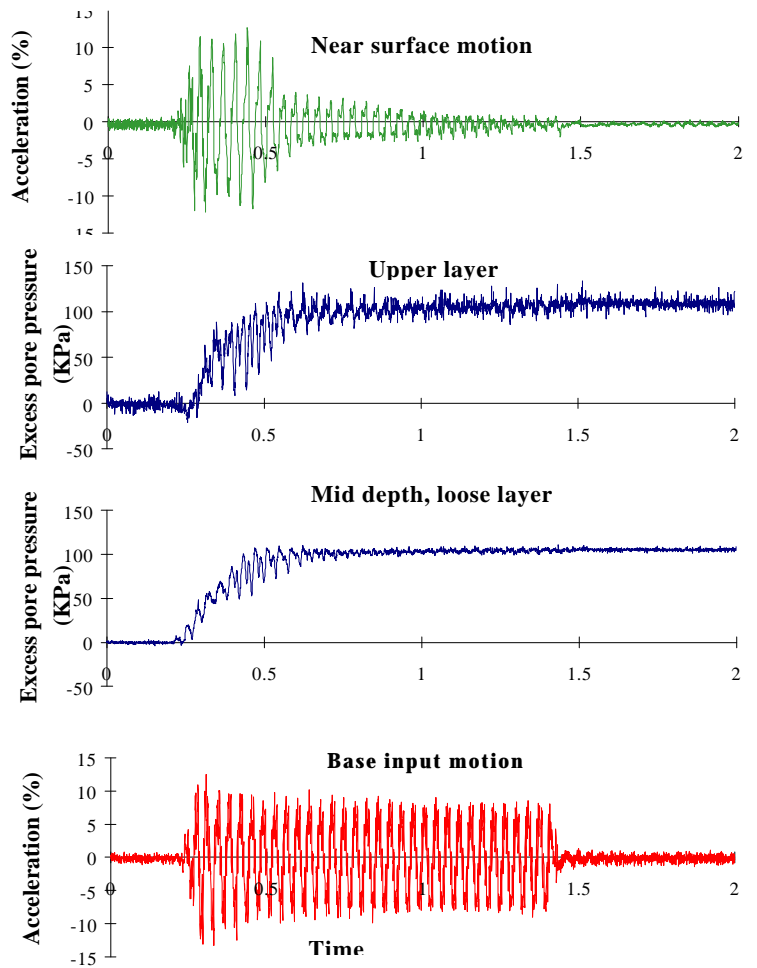
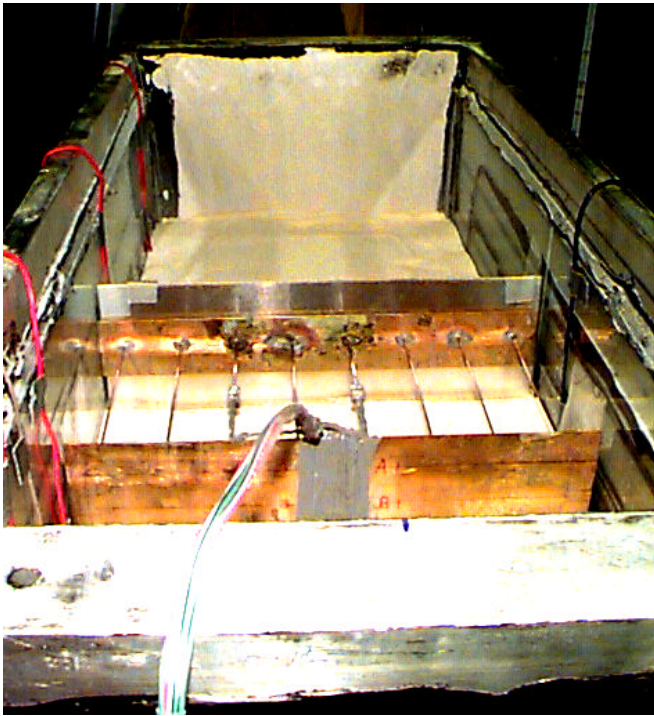


Figure 5. Dynamic load experiment time history raw data from pore pressure transducers and accelerometers.

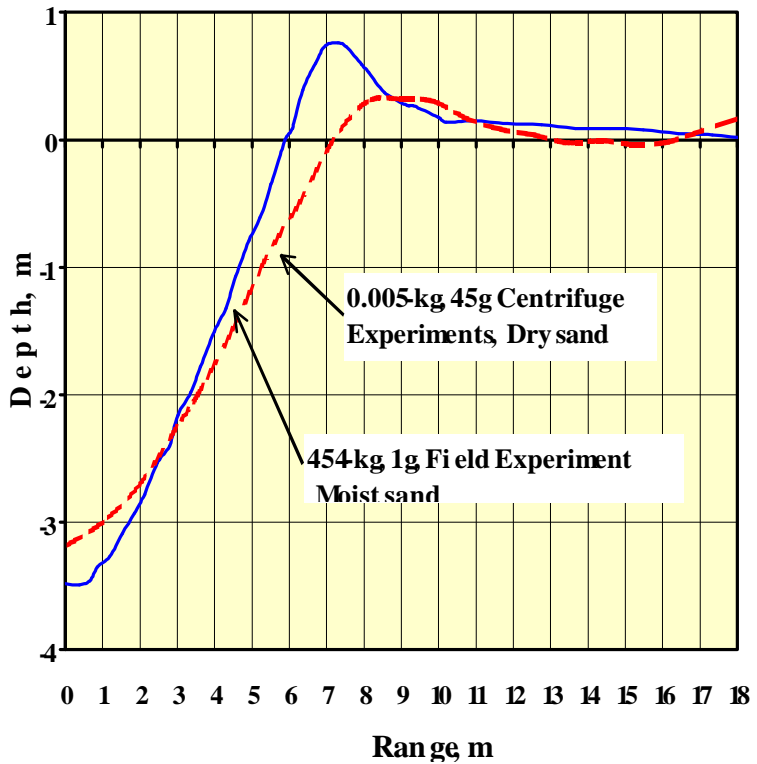
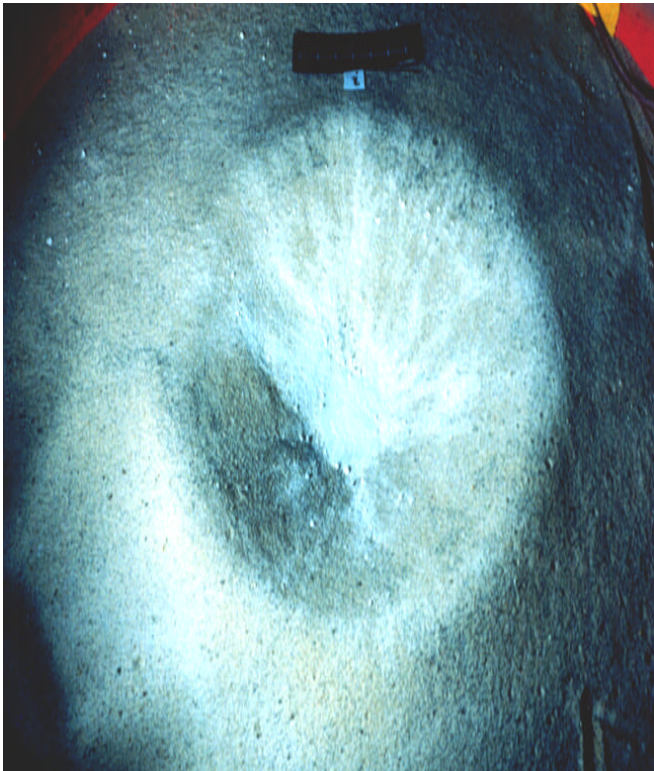


Figure 7. Comparison of crater profiles, field and centrifuge precision-scale experiments

Figure 6. Precision-scale cratering experiment conducted at 50 g centrifugal acceleration.